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SIXTH TECHNICAL MEETING ON FISHERIES
Suva, Fiji, 23 - 27 July 1973

PROSPECTS FOR CULTURE OF RABBITFISH IN THE SOUTH PACIFIC

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ABSTRACT

One of the main problems of developing mariculture in South Pacific territories lies in choosing the best species for cultivation.

Some well-known species (milkfish and mullet), successfully grown in various countries, are not suitable for the South Pacific because they are not acceptable to local people. Rabbitfish (Siganus) is, however, highly favoured. Noted are several other of its advantages which make this fish a promising subject for further study with the object of making concrete recommendations for large-scale culture.

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Recent plans and thoughts on large development of farming the edge of the sea (mariculture) may have especially important applications in the islands of the South Pacific and could contribute substantially towards protein requirements. A variety of sea-side habitats such as mangrove marshes, lagoons and swamps may possibly make such development feasible. A great deal of experimentation and applied research is necessary before large-scale operations are started. Knowledge of fish culture in general is extensive and promises a substantially greater protein supply than the culture of shrimps and other invertebrates. The latter though, if successful, could perhaps in some territories make contributions to the economy.

Choice of the right species of fish is basic for successful culture. Several factors have to be taken into consideration in selecting the best species of fish for cultivation, the main ones being:

1. Availability of fry
2. Resistance and adaptability to culture conditions
3. Feeding habits
4. Growth rate
5. Cost of operation
6. Acceptability of the fish as food
7. Marketable value.

Two different marine species have been studied and cultured successfully: milkfish and grey mullet. The milkfish (Chanos chanos) is grown on a large and profitable basis in Taiwan, the Philippines and in Indonesia.

Fry of milkfish is available in many areas of the Pacific Islands. It is very tolerant to many variables (i.e. temperature, salinity, pH, change of diet) and it will grow fast in shallow tidal ponds with no pumping and with little additional food and investment.

Similarly known and successfully cultured in many places (Hawaii, Taiwan, Korea, Israel, Italy, etc.) is the grey mullet (Mugil cephalus). It is hardy and fairly easy to grow. It has been successfully spawned in captivity, so far a rather complicated and expensive operation. Growing it through the larval stage is even more difficult.

These two species, however, are not favoured by the populations of many of the Pacific Islands; they do not, in general, command high prices and, where markets for these species are limited, the markets will be easily glutted.

A great deal of interest has been shown lately in the cultivation of rabbitfish (family Siganidae). Species of this fish are the most highly regarded in New Caledonia, Fiji and most territories of the Pacific. Very often they are not found in the markets as they find their way straight from fishermen to restaurants and hotels at high prices.

A quick survey of Fijian fish markets by Mr Tom Lichatowich showed that rabbitfish sells for 40 Fijian cents/lb (88 Fijian cents/kilo) compared to Fijian 25 cents/lb (55 Fijian cents/kilo) for mullet and Fijian 17 cents/lb (37 Fijian cents/kilo) for milkfish. In New Caledonia rabbitfish sells for 250 francs CFP/kilo (US \$2.50) and mullet 100 francs CFP/kilo (US \$1.00); milkfish does not sell at all.

Relatively little is known so far about rabbitfish but some of the known facts are promising:

1. Young rabbitfish (around $\frac{1}{2}$ g and some 2 cm in length) are found in large, dense schools in lagoons and in shallow waters in some Pacific islands around mid-summer. Because of this shoaling behaviour of the young fish they are relatively easy to catch in large numbers.

2. The fry are hardy and resistant to handling and changes in temperature and salinity and will grow in captivity.
3. Rabbitfish are natural herbivores, i.e. feed on algae and sea grasses. This is a desirable quality as it means they feed on a primary trophic level with a minimal loss of conversion energy (they will, however, easily change food habits in captivity and feed on fish pellets and tuna scraps).

Acceptability and market prices have been discussed already. It may be added, though, that the flesh of rabbitfish is very tasty and highly appreciated in many countries. They also have very few bones and no scaling is necessary; cleaning is very easy. No ciguatera poisoning by rabbitfish has so far been recorded, but their spines are sharp and very painful if stroked.

Three major factors about rabbitfish culture have to be thoroughly studied before making a positive decision on their suitability for aquaculture :

1. Growth rate. In the few experiments that have been carried out so far rabbitfish showed relatively poor growth rate compared with milkfish, mullet and freshwater fishes, i.e. approximately 200 g per fish per annum (with expensive additional feeding). It is possible, however, that under different conditions or diets growth rate may be improved. Practically nothing is known on density limits.
2. Very little is known of the cost of operation of rabbitfish culture as the requirements of the fish for faster growth (such as optimal water depth, types of food, temperature, water flow) have not yet been studied in detail.
3. The third problem is deciding which, if any, of the many species of rabbitfish (14 species are known in New Guinea alone) are most suitable for culture in different places and under different conditions.

The fact that rabbitfish have been easily spawned and fertilized in captivity (induced and natural spawning) may have application in future development of rabbitfish culture. The problem of carrying the fry through the larval stage is still to be studied and achieved. The difficulty, apparently, is in supplying the larvae (of some 2 mm long) with minute

live food. This has not yet been done successfully with rabbitfish and has only been done with one marine fish, the grey mullet, on a large scale. It is a complicated operation.

Although all the known facts about Siganids are very promising, rabbitfish culture needs much field research before starting operations on a large scale.
